7. Two outer layers each comprising a polymeric material or blend of polymeric materials

The 4,572,854 patent recites in col. 7, lines 14-15, "...outer sealing layers A..." and col. 7, lines 60-61, "A film sealable on both sides, comprising (1) an ethylene-propylene copolymer for layer A". Therefore the 4,572,854 patent specifically disclose the use of polymeric materials for outer sealing layers.

8. Two layers, each comprising an adhesive material, which adhere each of said intermediate layers to a respective outer layer

The 4,572,854 patent recites in col. 3, lines 34-35, "B contains adhesion-promoting material..." Figure 6 of the '854 patent illustrates layer B as located between the outer layer A and the intermediate layer C. Therefore the 4,572,854 patent specifically disclose the use of an adhesion layer located between layers A and C.

Consequently, all of the elements of claim 11 of the '419 patent except for element 6 the polyamide intermediate layers are disclosed and use of nylon in the intermediate layers would have been motivated so that the subject matter of claim 11 as a whole would have been obvious to one of ordinary skill in the art.

A. L. Blackwell, "Ethylene Vinyl Alcohol Resins As A Barrier Material In Multi-Layer Packages", J. Plastic Film & Sheeting, Vol. 1, (1985), pp 205-214.

The article of Blackwell specifically discloses all of the elements used in the claim 11 of the '419 patent to one of ordinary skill in the art. The Blackwell article describes the various technologies which were known to one of ordinary skill in the art for the use of EVOH for the design and manufacture of multilayer oxygen barrier packaging materials for perishable food products.

It specifically teaches the use of EVOH barrier layers to improve both the oxygen and aroma barrier of cast and blown (oriented) multilayer coextruded films (bottles and sheets) and that the barrier properties of the EVOH can be enhanced by orientation of the EVOH layers as is typical of most oriented films. However, it disclosed that EVOH barrier properties are compromised by water absorbed into the EVOH and that EVOH should be used in the interior of films and should be covered by appropriate moisture barrier materials such as the polyolefins. It would have been known or understood by one of ordinary skill in the art that the moisture protection would have been optimized by placing the EVOH in the center of a film and covering both surfaces with a moisture barrier layer.

The Blackwell article also disclosed that while 5 layer films were popular that 6 and 7 layer films were also being used.

The Blackwell article at p. 211 also disclosed "In balance structures, there are two equal thicknesses of adhesive layers and two equal thicknesses of the primary resin layers." In my opinion one of ordinary skilled in the art would have understood this to mean "arranged symmetrically".

Films containing intermediate layers of nylon adhered directly to the EVOH core were well known to one of ordinary skill in the art and as disclosed by Blackwell and the Journal of Commerce, would not have required an adhesive layer between the EVOH and Nylon (similar polarity and chemical compatibility). But one of ordinary skill in the art would have known that an adhesive would still be required between the Nylon and the outer polyolefin moisture barrier layer due to the difference in polarity and chemical compatibility between the polymers (as was the case with the EVOH) therefore resulting in a 7 layer coextruded film with the layers arranged symmetrically.

Consequently, the Blackwell article discloses all of the elements of claim 11 of the '419 patent. If the Court or the jury determines any of the elements are not disclosed in the Blackwell article it is also my opinion that the subject matter of claim 11 of the '419 patent would have been obvious to one of ordinary skill in the art based upon the Blackwell article alone or combined with other prior art references for the reasons presented in the motivations section below.

Rolf Hessenbruch, "Recent Development In Blown Film Coextrusion", Tappi Proceedings, Book 1, 1984 Polymers, Laminations and Coatings Conference, Sept 24-26 (1984), pp 85-94.

The Hessenbruch article discloses blown film (oriented) (p. 92, table 4) heat sealable, multilayer, barrier coextrusions which are of both symmetrical (p. 86) and asymmetrical configurations. The barrier films are for packaging applications and thermoforming (solid state orientation) with both nylon (p. 89) and EVOH (p. 88) barrier layers which are attached to outer polyolefin layers (p. 87) by the use of adhesive resins (p. 87). The article also disclosed the poor mechanical properties of the EVOH and the need to combine it with materials of higher mechanical strength and that nylon films are stronger than comparable EVOH films (p. 88). The article also discloses use of a split barrier layers and 7 layer films with 5 polymer combinations to improve barrier and thermoforming (Draw or orienting) properties.

Consequently, the Hessenbruch article discloses all of the elements of claim 11 of the '419 patent. If the Court or the jury determines any of the elements are not disclosed in the Hessenbruch article it is also my opinion that the subject matter of claim 11 of the '419 patent would have been obvious to one of ordinary skill in the art based upon the Hessenbruch article alone or combined with other prior art references for the reasons presented in the motivations section below.

Journal of Commerce Article, Hatley Article and Hatley Film

The Journal of Commerce article and the Hatley article disclose a film provided to Rutgers University. I will refer to that film as the Hatley film. The Hatley article discloses that the Hatley film is a 9 layer film with a structure (pp. 1, 4, 5 and 7):

HDPE/tie/nylon/tie/EVOH/tie/nylon/tie/HDPE

The Hatley article also discloses that the Hatley film was 1.40 mils thick (p. 7).

I am informed that more information about the Hatley film is being sought and may be obtained during discovery. I reserve the right to supplement my description of the Hatley film as additional information becomes available.

The Hatley article discloses coextruded films, it recites "nylon film coextrusions offer the most cost-effective barrier..." (p. 1).

The thickness of the Hatley film and the relative ratings of barrier protection would have indicated to one of ordinary skill in the art that the film was oriented. There is nothing disclosed that would indicate that it was unoriented.

No mention is made as to the thickness of the individual layers and the article does not use the term "arranged symmetrically" to define the layer arrangement. As no mention is made of the film having a preferred orientation in the tests it is my opinion that one of ordinary skill in the art would have understood that the layer pairs were identical in composition and would have had equal thickness, i.e. would have been arranged symmetrically. While it is not yet settled what the term "arranged symmetrically" will ultimately mean as claim construction has not yet been completed, I understand that to Cryovac it means only that the layer pairs are similar without regard to thickness of the individual layers. Therefore, this structure would apparently fall under Cryovac's definition (if it is not indefinite) because there is no indication of any difference in composition in the layer pairs.

However, even if the layers in the Hatley film were not arranged symmetrically, there would have been ample motivation to one of ordinary skill in the art to arrange the layers symmetrically to provide a film which would be curl resistant and which would give consistent product protection if turned over so that the subject matter of claim 11 of the '419 patent would have been obvious to one of ordinary skill in the art.

US Patent 4,640,852, "Multiple Layer Films Containing Oriented layers Of Nylon And Ethylene Vinyl Alcohol Copolymer", W. F. Ossian, assignee American Can Company, Feb 3, 1987.

1. An oriented

The '852 patent recites in col. 4, lines 10-11, "At least the recited first through third layers are molecularly oriented." Therefore, the '852 patent specifically discloses an oriented film.

2. Coextruded film

The '852 patent recites in col. 5, lines 2-4, "Layer 320 is the sealing layer, which is preferrably susceptible of coextrusion with the rest of the structure." Therefore, the '852 patent specifically discloses the coextrusion of a multilayer film.

3. Having at least 7 layers

The '852 patent does not explicitly describe the use of 7 layers. However, it does disclose the use of 5 layers. The obviousness of adding two additional layers is described below in the section entitled the obviousness of adding outer polymer layers.

4. **Arranged symmetrically**

The '852 patent does not explicitly describe a film with the layers "arranged symmetrically". The obviousness of having the layers be "arranged symmetrically" is described below in the section entitled the obviousness of adding outer polymer layers.

5. **A core layer comprising an ethylene vinyl alcohol copolymer**

The '852 patent recites in col. 5, l. 2, "Layer 314 is EVOH." Therefore, the '852 patent specifically discloses an EVOH core layer.

6. **Two intermediate layers each comprising a polyamide**

The '852 patent recites in col. 5, lines 1-2, "Layers 312 and 316 are nylon."

Therefore, the '852 patent specifically discloses two layers of nylon adhered directly to the EVOH core.

7. **Two outer layers each comprising a polymeric material or blend of polymeric materials**

The '852 patent recites in col. 5, lines 2-3, "Layer 320 is the sealing layer..." recites in col. 6, lines 31-37, "Layer 20, as at 320 in FIG. 3, is preferrably a heat sealable polymer. It is also preferrably susceptible of coextrusion with the rest of the structure as at 310. A highly satisfactory, and preferred composition for layer 20 is polypropylene copolymer, preferrably containing 2-8% ethylene. Another preferred composition for layer 20 includes linear low density polyethylene. Blends of PPE and LLDPE are also acceptable." Therefore, the '852 patent specifically discloses an outer layer of polymeric material and the obviousness of a second outer layer is discussed below in the section entitled the obviousness of adding outer polymeric layers.

8. **Two layers, each comprising an adhesive material, which adhere each of said intermediate layers to a respective outer layer**

The '852 patent recites in col. 5, lines 4-6, "Layer 318 is an adhesive which is effective to join layers 316 and 320 with good interfacial adhesion." Therefore, the '852 patent specifically discloses the use of adhesive layers for the adhesion of the nylon to the outer polymeric layers and the obviousness of a second adhesive layer is discussed below in the section entitled the obviousness of adding outer polymeric layers.

Consequently, it is my opinion that the '852 patent when combined with an additional pair of adhesive and outer polymeric layers adhered to the exposed nylon layer would have made the subject matter of claim 11 of the '419 patent obvious to one of ordinary skill in the art.

Translation of: Utility Model Application Publication Number: 60-27000, application number 54-84842, Mamoru Yoshimoto, Kyutaro Taleuchi, applicant Sumitomo Bakelite Co., Ltd., publication date August 14, 1985.

The English translation of Japan Utility Patent 60-27000 discloses the deep draw orientation of a coextruded 7 layer structure PP/tie/polyamide/EVOH/polyamide/tie/(PE EVA or ionomer) to improve its barrier property English Translation, Detailed Description, ¶3. It would have been understood by one of ordinary skill in the art that deep draw molding is a solid state orientation method and would have been capable of imparting both uniaxial and/or biaxial orientation to the drawn multilayer film or sheet.

Therefore, it is my opinion that the Japan Utility Patent 60-27000 discloses all of the elements claimed in claim 11 of the '419 patent except that the outer layers are not arranged symmetrically because they are made of different materials.

European Patent Application 0 063 006 A1, "EVOH copolymer blend, a process for producing a composite film therefrom and the composite film per se.", Oderzynski, T. W., Knott, J. E., Applicant American Can Company, 20/10/1982.

The 006 application is directed to multilayer, coextruded films for packaging which incorporate EVOH barrier layers and discloses the use of "structural layers, such as may provided by nylon, polyethylene, polypropylene and the like, and to various heat sealing layers, ..." to improve the toughness and brittleness of the EVOH containing films as well as the need for additional moisture barrier protection to maintain the EVOH is a dry state. It is my opinion that the '006 application supplies sufficient motivation for the incorporation of nylon intermediate layers into oriented multilayer EVOH containing structures in order to obtain the improvements and benefits set forth in the '006 application.

US Patent 4,608,286, "Gas Barrier Multilayer packaging Material Having Excellent Flexing Endurance", Yasuo Motoishi, Kenji Satoh, Kyoichiro Ikari, Assignee Kuraray Co. Ltd., Aug 26, 1986.

This reference is directed to the art of "...a flexible multilayer packaging material showing no reduction in gas barrier properties even under extremely severe flexing fatigue conditions. More specifically, it provides a flexible multilayer packaging material comprising a thin layer composed of a saponified product of an ethylene-vinyl acetate copolymer (hereinafter referred to as the EVOH) having gas barrier properties against oxygen, carbon dioxide etc. as an intermediate layer, said flexible multilayer packaging material being further provided with linear low-density polyethylene layers as surface layers on both sides of said multilayer packaging material." (Col. 1, lines 11-19.)

It is my opinion that the '286 patent in its discussion of split EVOH layers (col. 7, line s48-64) supplies additional motivation for the incorporation of intermediate nylon layers.

US Patent 4,361,628, "Coextruded Film of Polypropylene Blend and Nylon", Duane A. Krueger, Thomas W. Odorzynski, Assignee American Can Company, Nov 30, 1982.

The '628 patent discloses a nylon/EVOH/nylon/tie layer/polypropylene based layer (col. 3, lines 13-18) and would supply motivation for the use of nylon as intermediate layers surrounding an EVOH core layer as discussed below in the section on the obviousness of using nylon as intermediate layers.

Motivations for Obviousness

1. The Motivation For Adding Outer Polymeric Layers

The '852 patent discloses a molecularly oriented, 5 layer coextruded multilayer oxygen barrier film for the purpose of retort packaging. The '852 film structure has an exposed nylon layer attached to a core of EVOH which is attached to an additional nylon layer which is bonded to an outer polyolefin layer by a suitable adhesive polymer. Therefore, the '852 structure can be depicted as:

Nylon/EVOH/nylon/tie/polyolefin moisture barrier sealant

While this film is a good solution for the production of retort pouches as it allows for the recovery of the EVOH layers oxygen barrier after retort processing, the exposed nylon surface does not supply an adequate level of moisture protection for the EVOH to maintain the best potential oxygen barrier possible for the EVOH layer in non-retort applications.

In the area of oxygen sensitive foods, it was generally known to one of ordinary skill in the art that shelf life could be extended by improving the oxygen barrier of the film. As barrier layers of nylon/EVOH/nylon as shown in the '852 patent were well known to be more durable than single layers of EVOH, they were desirable barrier layers for oxygen sensitive products. However, nylon and EVOH will absorb moisture and nylon has relatively high moisture permeability and could not supply an acceptable level of moisture protection to the EVOH to optimize the potential oxygen barrier (figure 3 of Blackwell) and it was well known to one of ordinary skill in the art that EVOH and nylon/EVOH/nylon layers should be covered with moisture resistant layers such as polypropylene or polyethylene to optimize barrier properties (Blackwell, Journal of Commerce).

Indeed the person of ordinary skill in the art would have been motivated to cover the exposed nylon layer by adding the additional moisture barrier to the exposed nylon layer to further protect the EVOH from environmental moisture much as is described in the Blackwell reference p 210. However, it would have been obvious to one of ordinary skill in the art packaging that the addition of the extra polymeric moisture barrier layer will require the incorporation of an adhesive layer between the nylon and the outer barrier layer thereby producing a 7 layer structure. If the additional moisture barrier and adhesive layers were chosen to match the adhesive and moisture barrier polymer of the '852 patent then the 7 layer structure, sealant/adhesive/nylon/EVOH/nylon/adhesive/sealant, would be arranged symmetrically and all of the claim elements of claim 11 of the '419 patent would be met.

It would have been obvious to one of ordinary skill in the art to add the same adhesive layer and sealant layer compositions and thicknesses to the exposed nylon surface of the '852 patent as was already present on the other nylon resin and create a 7 layer structure with the layers arranged symmetrically. Arranging the layers symmetrically would have been known to prevent curling of the 7 layer film and could also have simplified the manufacturing of the film as no additional extrusion equipment (extruders, melt filters, resin storage, resin conveying equipment, etc) would be necessary and only a new 7 layer die and adapter would be required.

Therefore it is my opinion that one of ordinary skill in the art would have been motivated to add two additional layers to a 5 layer structure such as is in the '852 patent to form a film that meets all of the elements of claim 11 of the '419 patent, would have been obvious to one of ordinary skill in the art.

2. The Motivation For of Using Nylon In Intermediate Layers

At least US Patents 4,572,854 and 4,511,610 contain all of the claim elements of claim 11 of the '419 patent except that the intermediate layers are not comprised of nylon or polyamides. However, it is my opinion that the use of intermediate nylon layers adhered directly to (or by use of a tie layer) the EVOH core was well established and was well known to one of ordinary skill in the art. There was sufficient motivation to combine nylon with EVOH layers for the purpose of improving the durability and stretching (deep draw, thermoforming, vacuum thermoforming, draw blow molding) and performance of the films so that one of ordinary skill in the art would have found it obvious to substitute the nylon intermediate layers to the EVOH core.

When developing oriented multilayer films which are produced by blown or solid state orientation methods it is common to examine the literature for blow molding (melt orientation) and stretch blow molding or thermoforming disclosures (for double bubble or tenter frame orientation) to gain insights as to what material combinations and process parameters might be used to obtain oriented films of the disclosed resin combinations. This is because stretch blow molding is a biaxial, solid state orientation which can be performed simultaneously (as in the double bubble process) or sequentially (as in the tenter process). Thermoforming is also a solid state orientation process as it is performed above the glass transition or softening temperature of the polymers but below their melting point which is the same temperature range as used in sequential and simultaneous tenter and double bubble orientation processes.

There were several excellent reasons that one of ordinary skill in the art would have been motivated to include the nylon into the coextruded film. First the durability in flexing (and orientation) of the EVOH layer would have been significantly improved by the use of the nylon layers adhered to the EVOH layer surfaces, thereby improving the oxygen barrier and barrier durability of the composite film, and as the nylon is an oxygen barrier itself the composite film would have an additional oxygen barrier enhancement. As nylon is tough and puncture resistant, the overall toughness and puncture resistance of the film would have been improved by the nylon layer inclusion. Also, as disclosed in the Journal of Commerce, the Nylon layers in combination with the EVOH give a broader flavor and aroma barrier profile to the film than either the Nylon or EVOH would supply alone as each material has its unique chemical resistance profile which is the basis of the flavor and aroma barrier properties. The nylon was less expensive than the EVOH and the use of Nylon in conjunction with the EVOH permits the substitution of a portion of the EVOH by the Nylon, therefore using at least amount of the EVOH necessary to supply the appropriate oxygen barrier (augmented by the Nylon) and giving the broadest composite barrier (oxygen and flavor) to the combination for the lowest cost.

The '006 application discloses the use of nylon layers adhered directly to both plain and modified EVOH core layers (p. 7, lines 14-17). The use of nylon as a compatilizer and orientation and ductility improver for EVOH as well as a companion structural [barrier] layer adhered directly to the EVOH core layer was disclosed in EP 0063006 A1 which states on page

13, "As indicated previously, the EVOH copolymers are normally utilized in multilayer films including other components intended to impart toughness, structural integrity, water vapor barrier properties, tensile strength, and other characteristics. Typical of such companion layers are the film-forming polyamides,..., Because of the poor adhesion of EVOH compositions to most resins other than polyamides,..." and on page 15, "layers of nylon 6 on the opposite sides of a core of unmodified EVOH copolymer" and in example 4, p18 "the composite film product contains successive layers of nylon, modified EVOH copolymer, nylon, adhesive, SURLYN..."

The structure of the Japan application 60-27000 which exhibits improved flexibility due to the polypropylene [polyolefin] layers and pinhole resistance during deep drawing [orientation] when in combination with the nylon layers, Japan 60-27000, "... the polyamide resin layer – an intermediate layer used for improving the resistance to developing pinholes-..."

The English translation of Japan Utility Patent 60-27000 discloses the deep draw orientation of a 7 layer structure PP/tie/polyamide/EVOH/polyamide/tie/(PE, EVA, or ionomer) to improve its barrier property. It is understood by one of ordinary skill in the art that deep draw molding is a solid state orientation method and would have been capable of imparting both uniaxial and/or biaxial orientation to the drawn multilayer film or sheet.

The 4,361,628 patent discloses a 5 layer structure of:

a polymeric material/adhesive polymer/nylon/EVOH/nylon

and recites in:

> col. 1, lines 67-68, "Layer 16 is a polymer, copolymer, or blend thereof selected from the nylon family of polyamides" and in
>
> col. 3 lines 13-15, "Layer[ ] ... 116 ha[s] the same composition [ ], and serve[s] the same function[ ] as layer[ ] ... 16" and
>
> col. 3, lines 16-18, "Layer 120 is a layer of nylon, and may be any nylon which may be coextruded with the gas barrier layer",

Therefore the '628 patent clearly discloses the use of nylon adhered directly to both surfaces of an EVOH gas barrier layer and as shown in Figure 2 as an intermediate layer between an outer polymeric layer and an adhesive layer and the inner EVOH barrier layer.

It would have been obvious to one of ordinary skill in the art to substitute intermediate nylon layers attached directly to the EVOH layer to improve the films durability and pin hole resistance. As disclosed in the translation of Japan application 60-27000, and in US Patent 4,608,286 col. 3, lines 38-40, "..The EVOH resin films are all extremely poor in flexing endurance...", and in EP 0 063 006 A1, "... films made of EVOH tend to lack toughness and to be brittle." It is clear that one of ordinary skill in the art would have understood that the EVOH layer was sensitive to damage on flexing. However each of these disclosures disclose the incorporation of additional layers adhered to both surfaces of the EVOH core to improve durability, US Patent 4,608,286, col. 3, lines 60-62, "...the improvement of the flexing endurance is noticeable only when the linear low density polyethylenes is used as both surface

layers." The translation of Japan application 60-27000 discloses, "...the polyamide resin layer – an intermediate layer used for improving the resistance to developing pinholes -..." and EP 0 063 006 A1 discloses, "To accommodate such deficiencies and still take advantage of their attributes, the EVOH resins are normally used in multilayer films, wherein the EVOH layer is laminated to one or more structural layers such as may be provided by nylon..."

The Journal of Commerce article also discloses the advantages of the Nylon/EVOH/Nylon combination as "Nylon and EVOH can be used together in film structures, sandwiched as a core between layers of High-density polyethylene or other polyolefins for moisture protection, to provide an extremely cost-effective barrier to aromas, flavors and odors. Nylon forms an inseparable bond with EVOH, protects the more sensitive EVOH from heat degradation and flex cracking and serves as a moisture absorber. Both nylon and EVOH are said to have excellent oxygen barrier properties." The Journal of Commerce article also disclosed the economic advantage of combining nylon with EVOH to improve the overall film performance at a reduced cost.

Chemical or flavor and aroma barrier is desirable for taste sensitive products and is supplied by the proper selection of the "barrier" polymer. It was well known to those of ordinary skill in the art that EVOH, nylon, polyacrylonitrile or PVDC (Saran®) all could have been used as flavor barrier resins. This barrier property is a little more complex than oxygen because the optimum flavor barrier material will be dependent on the chemical nature of the flavor and the chemical resistance of the barrier polymer to the chemical of the flavor. Thus optimum flavor and aroma protection will be different for various polymers and when used in combination two or more flavor barriers will be better than any individual polymer (Journal of Commerce, Hatley article). This property alone would be motivation to combine barrier layers together into a composite barrier layer.

There also was motivation for one of ordinary skill in the art to use intermediate nylon layers based upon the disclosure of the '562 patent, the 7 layer Fant film sample, the Hatley film sample the Blackwell disclosure and the Hessenbruch article to obviate the requirement of a tie layer between the EVOH and Nylon layers.

The '286 patent specifically disclosed the use of outer layers of durable polymers such as LLDPE adhered to EVOH layers using appropriate adhesive polymer layers such that the layers could not delaminate from the EVOH. When produced in this manner, the adhered LLDPE layers impart to the composite film a dramatic improvement in the flex crack resistance during film flexing (using a Gelbo flex apparatus) as measured by a retention of the gas barrier properties of the flexed films.

The EVOH layer was located between the two surface layers but may not be centered on the films center line as it was disclosed that at times it was advantageous to use multiple EVOH layers, EVOH layers of different ethylene content have been shown to have different oxygen and moisture barriers (Blackwell figure 1). This split EVOH layer was used to enhance the moisture barrier protection of the lower oxygen barrier EVOH layer to improve its moisture protection from differential environmental moisture levels, Col. 7, ll. 48-64, "... the intermediate EVOH layer may also be composed of multiple sub-layers of two or more sub-layers. On providing multiple EVOH sub-layers, an optimum constitution may be chosen according to the desired

purposes. For example, the EVOH having the same ethylene content may be used in all the sub-layers. Where the relative humidity of the inside of the container etc. is greater than the outside of said container, e.g., the product to be packaged is an aqueous mixture such as wine, it is preferred to arrange in EVOH sub-layers having a smaller ethylene content outside and an EVOH sub-layer having a larger ethylene content inside also considering the humidity dependency of the barrier properties of the EVOH. On the other hand, where the relationship of the relative humidity is opposite to the above, the positional relationship of said EVOH sub-layers is preferably in the opposite order."

Example 3 of the '286 recites a symmetric 7 layer film col. 9, l. 67 to col. 10, l. 16 with a composite three layer barrier adhered to two outer layers of LLDPE by two adhesive layers.

LLDPE/adhesive/EVOH/adhesive/EVOH/adhesive/LLDPE

The three layer barrier core was comprised of two identical EVOH layers adhered together by an adhesive resin. While example 4 recites, Col. 10 ll. 36-42, the 7 layer film was the same as in example 3 with the exception that the EVOH layers were comprised of 2 different EVOH polymers.

LLDPE/adhesive/EVOH(example 3)/adhesive/EVOH(example 2)/adhesive/LLDPE

From the teaching of the 286 patent that EVOH oxygen barrier could have been protected by improved moisture barrier components in the barrier layer, It would have been obvious to one of ordinary skill in the art to substitute the lower moisture barrier EVOH with a nylon layer and obtain an improved moisture protection of the EVOH barrier layer by using the nylon as a moisture absorbing layer (Journal of Commerce). To obtain a further improvement in the flex crack durability of the EVOH It would have been obvious to one of ordinary skill in the art to replace the symmetric 3 layer core of example 3 with a symmetric nylon/EVOH/nylon core, using the nylon as moisture absorbing layers and improving durability of the EVOH from the adjacent nylon layers while reducing the cost of the structure by replacing the more expensive EVOH with less expensive nylon (Hessenbruch, Journal of Commerce) and to maintain a symmetrical film structure to eliminate the potential for curling from the split EVOH core.

3. The Motivation For Orient Multilayer Coextruded Films

At least the '562 patent, Fant film sample, Hatley film sample, Journal of Commerce reference specifically disclose all of the claim elements of claim 11 of the '419 patent but arguably do not specifically use the term "oriented" or specifically disclose oriented films. As I stated earlier, it is my opinion that the '562 patent specifically discloses an oriented film of claim 11 of the '419 patent and that the Hatley film is consistent with an oriented film. However, it is my understanding that the Fant film has been described by Cryovac as unoriented, and to the extent that it or the '562 patent or the Hatley film are found by the Court or the jury not to be oriented it is my opinion that there are many compelling reasons why one of ordinary skill in the art would have been motivated to orient those films.

A person of ordinary skill in the art would have been motivated to orient coextruded multilayer barrier films to improve the barrier properties, to improve the mechanical, optical, shrink properties and to minimize the amount of materials consumed in the packaging of the product.

Therefore one of ordinary skill in the art would have been motivated to orient films based upon ordinary skill or to apply to films that were not oriented the teachings of oriented film and the advantages of orientation as disclosed in references such as US Patent 5,055,355 which disclosed the coextrusion and uniaxial and biaxial orientation of a three layer nylon/EVOH/nylon coextruded film for the purpose of improving oxygen barrier (col. 4 lines 57-64) over and above that which would have been expected from separate films of oriented nylon and EVOH thereby showing the superiority of orienting coextruded multilayer films with nylon/EVOH/nylon barrier layers.

In addition US Patent 4,511,610 disclosed in col. 1 lines 25-31 the advantage of orienting multilayer structures with EVOH cores to reduce the thickness of the structure while improving the rigidity, impact resistance and other mechanical properties as well as the transparency and gas barrier property. The '610 patent speaks to the advantage of using draw forming or biaxial draw-blow forming to create molecularly oriented materials which would have been understood by one of ordinary skill in the art to be equivalent to the second step of the double bubble process.

Also the Blackwell reference indicates on page 209, paragraph 1 "as is typical of other oriented films, the biaxially oriented EVOH film has much better barrier properties over the full range of humidities."

US Patent 4,572,854 discloses the use of biaxial orientation of multilayer coextruded films with an EVOH barrier core layer for the purpose of improving the film's physical properties and particularly the barrier properties of oxygen and aromas, odors and flavors, (chemical barrier) (col. 6, lines 48-53). This reference also discloses multiple oriented barrier layers (col. 4 lines 66 to 68) with tie layers. Combining this reference with Blackwell on page 210 where it is disclosed that nylon/EVOH/nylon coextrusions require no tie layers would motivate one to orient multiple barrier layers of EVOH and nylon.

The English translation of Japan Utility Patent 60-27000 discloses the deep draw orientation of a 7 layer structure PP/tie/polyamide/EVOH/polyamide/tie/(PE, EVA, or ionomer) to improve its barrier property. It would have been understood by one of ordinary skill in the art that deep draw molding is a solid state orientation method and will impart uniaxial and/or biaxial orientation to the drawn multilayer film or sheet.

US Patent 4,640,852 discloses in Example 1, a 5 layer coextruded, molecularly oriented, multilayer film containing the layer structure of: nylon/EVOH/nylon/tie/EP copolymer (PPE) sealant. The polymer layers are molecularly oriented in the solid state and used for retort packaging and show enhanced toughness and durability. Thus it would have been obvious to one of ordinary skill in the art to orient coextruded multilayer barrier films to improve film properties.

The EP0063006 reference also specifically discloses the potential improvement of the composite barrier layer Nylon/EVOH(plasticized/Nylon in orientation during thermoforming EP0063006 p 15, "yet another benefit attributable to ... concerns the results that are achievable in thermoforming films containing a layer of modified EVOH copolymer... the film is heated to a temperature below its melting point but above which it can be permanently deformed ... and is

subjected to either mechanical or fluid pressure, so as to modify its shape." This specifically disclosed the use of solid state orientation to the film of EP0063006. And in example 4 of EP0063006 which two multilayer coextruded films of the structure Nylon/EVOH(plasticized)/Nylon/adhesive/Surlyn (film 1) and a second film Nylon/EVOH/Nylon/adhesive/Surlyn (film 2) and the composite films are subjected to the thermoforming operation described above, EP0063006 p 19, "Finally ... the two films[of example 4] subjected to thermoforming operations..." with the stated conclusion of EP0063006 being; EP0063006 p 19, "Thus, it can be seen that that the present invention provides a novel EVOH blend which can be coextruded with other resins to produce composite films of uniform caliber, which films are relatively tough and exhibit reduced tendency to form pin-holes, splits and the like when subjected to thermoforming [stretch orientation] operations or abuse".

Vacuum thermoforming would have been understood by one of ordinary skill in the art to represent a solid state orientation where the film would have been heated above a softening temperature but below its melting point as in tenter stretching or double bubble processing, and then drawn into a cavity or mold by the application of a vacuum between the film and the mold surface, thereby making use of the fluid pressure of the surrounding atmosphere to force (blow) the film into the mold thereby orienting the film in a uniaxially and / or biaxially manner equivalent to a solid state stretching operation as described in the '419 patent.

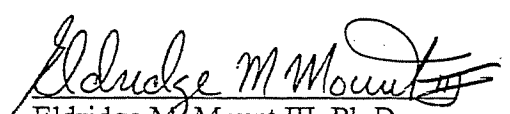
Also, haze is impacted by film orientation due to the reduction in light scattering at the interface between polymer crystals and the unoriented polymer phase (in semicrystalline polymers such as polyethylene, polypropylene, nylon, EVOH, adhesive polymers). On orientation, the non crystalline polymer phase is aligned in the direction of applied stress and the chains are brought "closer" together, increasing the average phase density and lowering the density difference between the oriented phase and the crystals. This lower density difference results in less light scattering at the crystal/oriented phase boundary scattering less light and lowering the film haze and improving the film optical properties.

Secondary Considerations

I have been informed that part of the obviousness analysis includes a determination of whether the secondary considerations (which I am informed are also sometimes called objective evidence of nonobviousness) indicate that subject matter is nonobvious.

I understand that Cryovac has not yet provided any information about whether it believes that there is evidence of secondary considerations that would tend to shown that the subject matter of claim 11 is not obvious. I am not currently aware of any evidence of secondary considerations that I believe would indicate that the subject matter of claim 11 would not have been obvious to one of ordinary skill in the art.

May 19, 2005



Eldridge M. Mount III, Ph.D

CERTIFICATE OF SERVICE

I hereby certify that I caused a true and correct copy of the **EXPERT REPORT OF ELDRIDGE M. MOUNT III,** to be served on the following counsel of record via Overnight Courier (Next Day Delivery Requested):

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This 19th day of May, 2005.

Attorney for Pechiney Plastic Packaging, Inc.

EXHIBIT 2

EXHIBIT 2

REDACTED IN ITS ENTIRETY

EXHIBIT 3

EXHIBIT 3

REDACTED IN ITS ENTIRETY

EXHIBIT 4

EXHIBIT 4

REDACTED IN ITS ENTIRETY

EXHIBIT 5

EXHIBIT 5

REDACTED IN ITS ENTIRETY

EXHIBIT 6

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

CRYOVAC, INC., Plaintiff/Counter-Defendant. vs. PECHINEY PLASTIC PACKAGING, INC., Defendant/Counter-Plaintiff.	Civil Action No. 04-1278 Hon. Kent A. Jordan

SECOND SUPPLEMENTAL REPORT OF LARRY W. EVANS PURSUANT TO FEDERAL RULES OF CIVIL PROCEDURE RULE 26(A)(2)(B)

Pursuant to Rule 26(A)(2)(B), I submit the following Second Supplemental Report of my opinions in this matter. This report is submitted on behalf of Pechiney Plastics Packaging, Inc. ("PPPI"). In my initial Expert Report filed June 25, 2005, I reserved the right to supplement or modify the opinions expressed in the two reports depending on additional discovery or other information provided in this matter.

I. Introduction

1. This report is submitted pursuant to the following statement in my initial Expert Report (Paragraph 41):

> "When information is available to me concerning any incremental economic benefit to PPPI of pursuing ClearShield™ rather than one of its available and acceptable non-infringing alternatives (see above), I will opine with respect to the manner in which the benefit (if any) should be shared between Cryovac and PPPI."

2. In my Supplemental Report filed on August 5, 2005, I identified, in Paragraph 15, the apparently best alternative to the accused product which PPPI intends to commercialize. It should be noted that PPPI's development of this alternative has been (and remains) independent of this litigation; rather, the alternative is being commercially developed because it offers superior economics and physical properties as compared to the accused ClearShield™ product.

II. Detailed Discussion

3. In Paragraph 15 of my August 5, 2005 Supplemental Report, I indicate the following:

> " . . . PPPI is modifying the ClearShield™ film by replacing the EVOH layer with a polyamide resin; (the program is) underway, and initial results are very positive. Mr. Kitchel reiterated that the modification was independent of this patent controversy. PPPI believes the modified film will be improved as a result of this change. It would also appear that this change would result in a film that would clearly not infringe the claim. Dr. Kimmel's deposition testimony appears to confirm this conclusion (see Kimmel transcript, p. 149 to p. 170)."

4. In a subsequent telephone conversation with Mr. Kitchel (August 11, 2005), Mr. Kitchel informed me that the replacement of the EVOH copolymer "core" layer with a polyamide (nylon) results in a raw material cost reduction of 5¢ per pound of film, i.e. $1.33 per pound rather than $1.38 per pound. This represents a savings in raw materials cost of 3.6%. All other costs would remain the same. The final manufactured cost of the alternative product would be about $1.95 per pound vs. $2.00 per pound for the accused product, i.e., an overall cost savings of about 2.5%. The resulting product, according to Mr. Kitchel, has an oxygen transmission rate of about 20 $cc/m^2/day/atm$. Bone-in FRM bags require a rate of 25 or less. Thus, the alternative bags are well within the requirement for oxygen barrier.

5. When I asked Mr. Kitchel why the accused ClearShield™ product was chosen as the commercial product in late 2003, he indicated that PPPI wanted to minimize polyamide

content while retaining oxygen barrier purely for economic reasons; however, they quickly realized that sufficient polyamide was necessary to achieve puncture resistance. With more polyamide resin in the product, oxygen resistance (barrier) was also improved to the extent that the more expensive EVOH copolymer could be removed.

6. In addition to its more than required oxygen barrier property, Mr. Kitchel informed me that the alternative, non-EVOH copolymer film product has better "extrudability" and "bubble stability." Production of the alternative would, in effect, be easier and no equipment changes would be needed. In other words, PPPI could make the change "on the run."

7. Reiterating Mr. Kitchel's previous comments (see Paragraph 47 of my initial Expert Report),

> "FRM customers are concerned only about price and performance, something they call 'packaging cost per head' . . . . Such customers are not at all concerned about the number of layers, whether they are 'arranged symmetrically,' or their composition so long as they are safe."

Here, the alternative product will yield the same (or potentially lower) "packaging cost per head." It has identical clarity, superior physical properties and more than adequate oxygen barrier.

8. According to Mr. Kitchel, the alternative product (without EVOH copolymer) has been introduced to National Beef. The alternative is currently under testing at PPPI to confirm shelf life and biological properties. PPPI expects to change over to the alternative product within 30 to 60 days. A complete change over to the alternative will then occur, following inventory "clear out" of the accused product.

9. In view of the above, the non-EVOH copolymer alternative described in Paragraph 15 of my Supplemental Report and in the above paragraphs of this report is an "acceptable" and "available" non-infringing alternative to the accused ClearShield™ product